**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

1. (Currently Amended) A device for thermal overload protection of an electrical device, particularly an electric motor, the device comprising

a current meter configured to measure at least one load current supplied to the electrical device;

a processor system configured to calculate a thermal load on the electrical device on the basis of said at least one load current, and

a switch device disconnecting a current supply when the thermal load reaches a given threshold level,

said processor system employing 32-bit fixed-point arithmetic and being configure to scale the measured current into unit values to a range of 0 to Y, wherein Y represents Y/100% of a nominal current and is a real number greater than 0, and to calculate the thermal load using a mathematical equation that, together with its operands, is programmed into the ~~microprocessor~~ processor system structured such that a result or a provisional result never exceeds the 32-bit value,

wherein the mathematical equation is

$$\Theta_k = \Delta T * \frac{i^2}{C} + \left(1 - \frac{\Delta T}{R * C}\right) * \Theta_{k-1}$$

wherein

$\Theta_k$ = currently calculated thermal load

$\Theta_{k-1}$= previous thermal load

$\Delta T$ = interval for thermal load calculation

R = cooling factor of electrical device

C = trip-class factor

i = measured current.

2. (Cancelled)

3. (Currently Amended) [[A]] The device as claimed in claim [[2]] 1, wherein one or more of following operand values are used

$\Theta$ = 0 to 200% preferably corresponding to a value range of 0 to 2.4

$\Delta T$ = interval for thermal load calculation in milliseconds

R = cooling factor of electrical device in a range of 1 to 10

C = trip-class factor

i = measured current.

4. (Cancelled)

5. (Cancelled)

6. (Currently Amended) [[A]] The device as claimed in claim 3, wherein C is trip-class factor $t_6$ multiplied by a constant, preferably 29.5, or calculated by the formula $(1/k) * Te * (Ia/In)^2$, wherein $t_6$=trip-class factor, Ia = starting current, In = nominal current, Te = allowed starting time and k = constant, preferably k = 1.22.

7. (Currently Amended) A method for thermal overload protection of an electrical device, particularly an electric motor, comprising

measuring at least one load current supplied to the electrical device,

scaling the measured current into a unit value to a range of 0 to Y, wherein Y represents Y/100% of a nominal current and is a real number greater than 0,

calculating the thermal load on the electrical device on the basis of said at least one load current using a 32-bit processor system employing fixed-point arithmetic, wherein a mathematical equation for thermal load is programmed structured such that a result or a provisional result never exceeds the 32-bit value, and

interrupting current supply to the electrical device when the thermal load reaches a given threshold level,

wherein the mathematical equation is

$$\Theta_k = \Delta T * \frac{i^2}{C} + \left(1 - \frac{\Delta T}{R * C}\right) * \Theta_{k-1}$$

wherein

$\Theta_k$ = currently calculated thermal load

$\Theta_{k-1}$= previous thermal load

$\Delta T$ = interval for thermal load calculation

R = cooling factor of electrical device

C = trip-class factor

i = measured current.

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Currently Amended) [[A]] The method as claimed in claim [[8]] 7, comprising C being trip-class factor $t_6$ multiplied by a constant, preferably 29.5, or calculated by the formula (1/k) * Te * $(Ia/In)^2$, wherein $t_6$=trip-class factor, Ia = starting current, In = nominal current, Te = allowed starting time and k = constant, preferably k = 1.22.

12. (Cancelled)

13. (Cancelled)

14. (Currently Amended) ~~A device~~ The apparatus as claimed in claim [[4]] 19, wherein C is trip-class factor $t_6$ multiplied by a constant, preferably 29.5, or calculated by the formula $(1/k) * Te * (Ia/In)^2$, wherein $t_6$=trip-class factor, Ia = starting current, In = nominal current, Te = allowed starting time and k = constant, preferably k = 1.22.

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Currently Amended) An apparatus comprising a processor and a memory storing executable instructions that perform:

measuring at least one load current supplied to an electrical device, particularly an electric motor,

scaling the measured current into a unit value to a range of 0 to Y, wherein Y represents Y/100% of a nominal current and is a real number greater than 0,

calculating a thermal load on the electrical device on the basis of said at least one load current using a 32-bit processor system employing fixed-point arithmetic and a programmed mathematical equation structured such that a result or a provisional result never exceeds the 32-bit value, and

interrupting current supply to the electrical device when the thermal load reaches a given threshold level, in order to protect the electrical device against thermal overload.

wherein the mathematical equation is

$$\Theta_k = \Delta T * \frac{i^2}{C} + \left(1 - \frac{\Delta T}{R * C}\right) * \Theta_{k-1}$$

wherein

$\Theta_k$ = currently calculated thermal load

$\Theta_{k-1}$= previous thermal load

$\Delta$T = interval for thermal load calculation

R = cooling factor of electrical device

C = trip-class factor

i = measured current.